



## TELEMEDICINE: A PERSPECTIVE FROM A SPECIALITY CENTRE

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**ABSTRACT** **Background:** Healthcare delivery in India is characterized by large urban-rural gap in terms of health infrastructure and trained manpower. To bridge this gap, Government of India has started eHealth initiatives like National Telemedicine Network (NTN) and National Medical College Network (NMCN). These have widespread application in patientcare, education, research, administration and public health.

**Aim:** To study utilization pattern and trend of telemedicine consultations provided at Telemedicine Speciality Centre (TSC).

**Materials and methods.** This was a retrospective study conducted at TSC. Data of teleservices provided from 2008 to 2017 was analyzed.

**Results:** Increased utilization of telemedicine services was observed with few fluctuations and regional inequalities. Imaging and speciality consultations were more commonly sought from patient nodes.

**KEYWORDS :** Telemedicine, Speciality, Patient Node, Utilisation.

### Introduction:

India is a land of diversities and healthcare delivery is not an exception. Indian healthcare delivery is characterised by remarkable urban-rural gaps in terms of provision of health services. Telemedicine is being increasingly used for delivery of healthcare services in difficult to reach areas and places where speciality services are not available. Telemedicine has widespread application in areas like patient care, education, research, administration and public health. <sup>(1)</sup>The World Health Organization (WHO) defines Telemedicine as, "The delivery of healthcare services, where distance is a critical factor, by all healthcare professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation and for the continuing education of healthcare providers, all in the interests of advancing the health of individuals and their communities." <sup>(2)</sup> To bridge gap in urban and rural healthcare delivery and to achieve Universal Health Coverage, Government of India has undertaken use of Information and communication Technologies (ICTs). In existing healthcare delivery system, initiatives like National Telemedicine Network (NTN) and National Medical College Network (NMCN) have been undertaken. <sup>(3)</sup>

The potential of telemedicine, as a tool for delivery of healthcare was recognized by the Government of India in the year 2000. The telemedicine initiative was formulated by the Government of India with the involvement of Department of Information Technology (DIT), Ministry of Communications and Information Technology and the Indian Space Research Organization (ISRO), various state governments, and several premier technical and medical institutions all over the country. <sup>(4)</sup>

In early 2000, DIT started telemedicine projects in different parts of the country. As a prime organizer of telemedicine projects, DIT has undertaken major initiatives for the development of technology and standardization of telemedicine in the country. It has established more than 75 nodal centers all over the country to support research and development of telemedicine.

In Maharashtra, from 2007 to10, telemedicine patient nodes were established at twenty-three District Hospitals. During 2010-2011, the facilities were further expanded to thirty-three Sub-District Hospitals/Rural Hospitals. To provide teleconsultation services to these patient nodes, six Telemedicine Speciality Centres were set up. Out of six, three are located in Mumbai and one each in Pune, Nagpur, Aurangabad.

This study was planned to gain an insight into utilisation patterns of various services provided at a Telemedicine Speciality Centre (TSC) in Mumbai, Maharashtra.

### Objective:

1. To study the utilisation profile of telemedicine services in a TSC.
2. To analyse the trend of utilization of tele-medicine services in a TSC.

### Materials and Methods:

This is a cross sectional retrospective study conducted at Telemedicine Speciality Centre (TSC) in Seth G.S. Medical College and KEM Hospital, Mumbai, Maharashtra. This TSC provides tele-education [through Regional Resource Centre (RRC)], teleconsultation, telemonitoring and support services. The data of various Tele services provided during 2008-2017 (Nine years) were compiled and analysed using Microsoft Excel 2016 and SPSS version 22. Year wise, speciality wise and region wise utilisation was studied.

### Results:

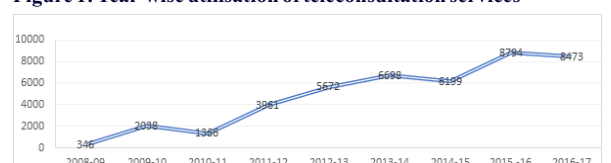
Total 43,547 teleconsultations were provided over nine years.

**Table 1: Utilisation profile of teleconsultation services**

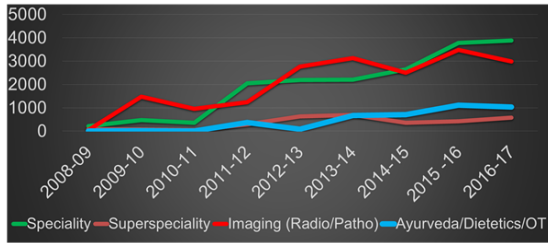
Teleconsultation services	No. of consultations (%)
<b>Speciality</b> (Medicine/ Surgery/ OBGY/ Pediatrics/ Skin/ Anaesthesia/ Ophthalmology/ Otolaryngorhinology/ Psychiatry/ Dentistry/ Orthopedics/ Forensic)	17801 (40.9)
<b>Super-speciality</b> (Cardiology/ Pediatric Surgery/ Plastic Surgery/ Neurology/ Hematology/ Nephrology/ Urology/ Gastrointestinal Surgery/ Cardiovascular surgery/ Neurosurgery/ Neonatology)	3180 (7.3)
<b>Imaging</b> (Radiology/ Pathology)	18564 (42.6)
Ayurveda/ Dietetics/ Occupational Therapy	4002 (9.2)
<b>Total</b>	43,547

Teleconsultations provided for imaging in Radiology and Pathology for diagnostic purpose were maximum (42.9%). The opinions were also sought for preventive and rehabilitative services through Dietetics and Occupational Therapy.

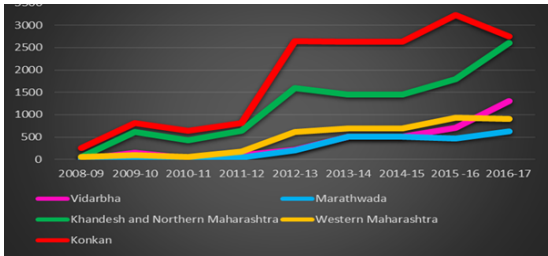
**Figure 1: Year-wise utilisation of teleconsultation services**



Increase in the utilisation of teleconsultation services has been observed except for the year 2010-2011 and 2014-2015.

**Figure 2: Year wise and Speciality wise utilisation of teleconsultation services**

After 2013-2014, utilisation of Ayurveda/Dietetics/Occupational Therapy teleconsultations has increased and is more than super-speciality services. After 2014-2015, consultations for imaging have reduced compared to other specialities.

**Figure 3: Regional Utilisation of Telemedicine Services**

Regional utilisation for the state of Maharashtra shows consistently high usage in Konkan and Khandesh/ Northern Maharashtra region.

**Discussion:**

Maximum teleconsultations were conducted for speciality opinion including radiological imaging (83.5%). Super speciality, Ayurveda, Dietetics and Occupational Therapy teleconsultation services were also used; but to a lesser extent (16.5%). Increasing trend in utilisation (with dips during 2010-11, 2014-15 and 2016-17) of Tele Medicine services has been observed. Services have been accessed from rural and remote areas of the state as well. However, regional inequalities were observed. In a study conducted for implementation of Telemedicine in Tripura, it was observed that from June, 2005 to March, 2013, more than 30,000 patients were treated or consulted covering the major disciplines such as Medicine, Radiology, Orthopedics, Pediatrics, Gynecology, Surgery, Dermatology etc. <sup>(5)</sup>

Teleophthalmology has been successfully established by various health institutes across India. <sup>(6-9)</sup>

**Conclusions:**

Increasing and varied utilisation of telemedicine services with little fluctuations in between was observed in the present study. Linking and correlating these fluctuations and inequalities with annual and regional morbidity pattern respectively will help to gain better practical insight in this regard. Mapping of morbidity profile and epidemiological determinants may facilitate enhanced utility and effective planning of preventive and curative services available at TSC. Further research is needed to ensure effective implementation and development of telemedicine strategies at patient node sites.

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